

A REVIEW OF TECHNOLOGY READINESS INDEX (TRI) ON RETAIL INDUSTRY: APPROACH AND APPLICATION

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Abstract

The use of technology in some business applications have been growing rapidly recently in regard to improve competitiveness and customer responsiveness. This article attempts to explore the application of the adoption of new technology on the business processes. The focus of this article is reviewing the readiness of technology adoption on the perspective of its approach and applications. Content analysis method is applied in this study by reviewing literatures based on the content of the articles found. The results indicate that consumer's readiness in accepting new technology offered plays a key role in a new technology adoption in a business.

Key words: Technology Readiness, Approach, Application

1. Introduction

In the current era, the role of technology is very important for companies to increase sales of products or services. Not just to increase sales, technology is also used to interact between companies and consumers. However, along with the development of technology does not rule out the possibility that will cause a little confusion to consumers. It is because consumers have been accustomed to the process without the technology that accompanies.

The interaction between technology and costumers have made Parasuraman conducted research in 2000 with the title "Technology Readiness Index (TRI): A Multiple-Item Scale to Measure Readiness to Embrace New Technologies". This study discusses the readiness of a consumer in accepting new technology or better known as *Technology Readiness Index* (TRI). In the study, Parasuraman stated that not many or only a few scientists are examining a person's readiness issues in using technology-based systems [1]. *Technology Readiness Index* (TRI) could be used as a method for marketers to know consumer behavior toward new technology so that they can work effectively.

Not many researchers are doing research on Technology Readiness Index (TRI) especially in the field of retail industry. This is evidenced by the existence of research that refers to other part of businesses other than the retail industry. For example, in the service perspective, a study by [2] explore the use of TRI abbreviation for hotel customer segmentation. The study focuses on hospitality that aims to improve the effectiveness of customer profiles, not only for the use of technology but also for market segmentation. Other study by [3] investigates the technology readiness effects on post-adoption behavior. This study focuses on IPTV users in Korea which aims to examine post-adoption technology consumer behavior and knowing how Technology Readiness influences the intentions of using new technologies.

Now days, technology has penetrated into retail industry, where with the existence of this technology, consumers are made easier in shopping and consumers can get the benefits other than getting a product, for instance, obtaining some credits or points after shopping using new technology in the form of application from their mobile phone. The collected points can be used again for shopping or getting any discount when shopping using application which have been provided. So, in the presence of new technology, not only producers could generate profits, but consumers also gain the benefits after making the process of shopping. The adoption of new technology in the form of this application in the retail industry is a new trending topic to discuss, however not many researchers concern with this issue and not many retail industries apply this technology because it is not easy to introduce new technology for retail consumers. Thus, this article attempts to explore the use of new technology in retail industry and its implications on customers service. In this article, the discussion

focuses on the approaches and application used in TRI for retail industry that have not given much attention previously.

2. Methodology

Content analysis method is used in this article for reviewing literature. This method is used in some studies, and it is an approach to gather valid data by purpose of providing new insights, comprehensive understanding for readers and researchers and managerial or practical actions. The method used in this study is based on existing literature publications that include: thesis, dissertations, and journal articles from different databases such as from Google Scholar, Scopus, Science direct and EBSCO host. Keywords like technology, inventory control, and organizational performance were utilized to discover connected literatures. Previous information that includes the subject of technology readiness adopted in this study as the scholarly works published on the topic area is still inadequate. Thus, just literatures written in English are examined in this study.

3. Related Literature Review

3.1 Technology Readiness Approach

Technology is a form of activities that exist in human culture where it applies the principles of science and there is a solution of the problems that exist. People can easily feel the influence of the development of the technology world in many ways [4]. The technology used by companies in selling products and serving consumers is growing rapidly. Not just the company, consumers also become very sensitive about technology. Therefore, the interaction between companies and consumers is changes with long-term implications for companies and consumers[5].

Technology readiness explains the possibility of someone appreciating and applying new technologies. At the same time, innovation defined in the product development literature is one's willingness to adopt new products [6]. There are many ways to find out how consumer readiness uses new technology using four segments, as (1) optimism (the consumer's view of a technology) (2) innovativeness (a tendency for consumer who use the technology for the first time) (3) discomfort (hard to control and tend to have difficulties when dealing with technology) (4) insecurity (suspicious with the security of technology with the reason of the security of personal data)[7]. Those dimensions are widely used to measure the readiness of customers or staff on the interaction of technology adoption.

In a culture, individuals are not passive recipients of innovation. Despite a high degree of variation, individuals seek innovation, experiment with these innovations, evaluate them, develop, complain about problems, and gain experience in their social environment. [8] The result of technology-based services is creating an experience for consumers and increasing the level of diffusion. Diffusion is a process of innovation that spreads to a population through various channels over time[9].

Someone who innovates and has a high level of optimism and has little sense of insecurity and uncomfortable, will be better prepared to use new technology [10]. In a study, there were some people who have phobia or pessimism about technology. Consumers who have a high level of anxiety on technology then the technology will be hard to accept. This could happens due to a new technology could be the thing that is not easily accepted or on the other words, customers or staff are not ready to use technology [11].

Parasuraman and Colby reveal ways to find out how consumer readiness uses new technology using four segments, as (1) optimism (the consumer's view of a technology) (2) innovativeness (a tendency for consumer who use the technology for the first time) (3) discomfort (hard to control and tend to have difficulties when dealing with technology) (4) insecurity (suspicious with the security of technology with the reason of the security of personal data)[7].

For some countries such as Indonesia, which has a densely populated land that becomes profitable for investors in the retail sector. The ease of permission to establish a modern market also has a role in the rapid development of modern markets. According to the survey, in 2006 the total growth of modern market in Indonesia is 14.3% and modern store is growing at 23.8% much faster than traditional market growth which only reaches 9.6%. Retail sector growth showed a rapid growth, namely Hypermart 12.6%, supermarket 6.4%, and minimarket by 34.2% [12].

For the company, in term of maintaining customer loyalty, creating product or service innovation is an important activity. Innovation in term of service improvement on products or services should be able to provide benefits for both parties involved: companies and consumers. Most product and service innovations in the area of retail industry are led to the use of new technologies. For consumers who are familiar with and accustomed to using a technology it will have no difficulties to adopt new technology offered (Tabel 1).

Table 1 Technology readiness and combination of approaches

Approaches	Author(s)
Theory of technological development	Bitner et al.[5], Ahmet & Demirci [4]
Theory of technology readiness	Gerard J. Tellis et al.[6], Parasuraman and Colby [7], Liljander et al. [10], Chris and Hsing-Chi [11]
Theory of innovation	Greenhalgh et al.[8], Fichman and Kemerer [9], Liljander et al. [10], Agarwal and Prasad [13], Parasuraman [1]
Theory of marketing	Mawardi [12], Parasuraman and Colby [7]
Technology Acceptance Model (TAM)	Lin, Shih, and Sher [14], Lee [15], Martins, Oliveira, and Popovič [16]
Theory of planned behavior (TPB)	Lee [15], Masudin, Wastono, and Zulfikarijah [17]

3.2 Technology Readiness Application

Currently, new technologies are being developed in several retail industries such as Hypermart and Matahari Department Store. This retail industry has started to use new technology in the form of OVO applications that can be used to shop. OVO is an e-money application (electronic money). With this new technology, customers are facilitated and rewarded with bonuses and discounts. Customers who have high innovation, feel comfortable using technology [13]. Innovation makes one tend to try new things [1]. The concept of consumer confidence in products and technology, related in technological readiness variable [14]. Consumers will be more inclined to use a technology which it can provide pleasure, efficiency, and comfort for users [18]. As is the case with OVO applications that not only serve the use of (e-money) electronic money in industrial retail, but inside the applications can make any payment, such as bank transfers, food and beverage purchases, ticketing.

E-money is one of the electronic communications that consumers can use as a means of payment [19]. E-money is not a "cash" that can be transferred from hand to hand without an intermediary or a third party [20]. The e-money product is in the form of a record of funds and stored in an electronic device [21]. Overall, e-money is an electronic payment instrument that can be used for various transactions, expense records and balances will be recorded in the application of electronic devices used by consumers.

With this application, consumers are made easy to make multiple payments at once without having to go to certain places to make payment. For banking transactions, this application provides transfer services to almost all banks in Indonesia with minimum transfer of IDR. 10,000 and there is no administrative fee for this transaction. This is a new revolution to facilitate electronic transactions as a new type of payment instrument that consumers can getting information and communication from such a system [22].

Online banking transactions are regarded as one of the most effective transaction methods [23]. Besides that, there are several risks that must be considered when consumers doing online banking transactions [16]. In a study there are five risks that can be experienced by consumers when doing banking transactions via online, like privacy risk, social risk, financial risk, time risk and performance loss risk [15].

In this modern era, e-money is not only used to perform banking transactions online but can be used to make food and beverage payments and ticketing. Consumer perceptions will have an effect on the use of technology. Consumers tend to use technology depending on their performance. Although

many difficulties are experienced but is proportional to the benefits to be gained. It also affects someone in using technology [24]. In addition to increasing the use of technology, the high perception of ease will make consumers feel the benefits of technology so that perceived consumer perceived benefits will increase [24-26]

If a consumer believes that a technology can provide benefits then the consumer will use it. The benefits of the technology used are related to effectiveness, productivity, performance, and overall benefits [27]. Consumer confidence includes the perception of convenience and benefits, consumer attitudes toward technology will be the basis of interest in the use of technology [11].

Table 2 The application of technology

Applications	Author(s)
Technology Readiness	Lin et al.[14], Lin & Hsieh [18]
Electronic Money	Al-Laham [19], David [20], Bob [21]
Electronic Banking	Papadopoulos [22], Huang et al.[23], Martins et al. [16], Lee [15]
Consumer Perception	Davis [24], Shin & Lee Shin & Lee [25], Venkatesh & Davis [26], Pratiwi et al [27], Chris & Hsing-Chi [11]
Logistics	Richey, Daugherty and Roath [28], Lin and Hsieh [29]
Supply chain Management	Masudin, Wastono, & Zulfikarijah [17], Michael & McCathie [30]

4. Results and Discussion

The development of the use of technology in retail industry has been progressing significantly recently for staff or customers as the users. The issues of the application and approach of using new technology in retail industry is identified as the readiness of technology adoption. Most researchers have emerged some other approaches into technology readiness index (TRI) theory. Some studies have combined technology readiness approach with popular theories such as theory of acceptance model (TAM) to elaborate the link between the acceptance and the readiness of technology adoption. For instance, the integration of TAM and TRI becomes TRAM (technology readiness and acceptance model) have been used to augment TAM by considering the dimensions of technology readiness into the practical consumers' adoption of innovation Lin et al. [14]. The integration of other approaches into TRI theory could also be found in the theory of planned behaviors (TPB) to understand the motivation of staff or customers in adopting new technology in their workplace [15, 17]. Moreover, the combination of theory of marketing into TRI theory is most discussed by researchers due to close relationship between Tri and customers service [1], [7].

In term of the application of technology readiness on the industry, it is found that most businesses apply new technology in the area of front-line services and outbound logistics activities. Electronic banking and electronic money are discussed frequently by researchers in the application of retail industry. E-money/e-banking applications such as rOVolution (OVO) e-payment in Indonesian retail industry and Octopus e-payment in Hong Kong retail businesses [31] are the example of the growing application technology offered to customers. Therefore, e-money and e-banking have been given much attention to discuss by previous research [21], [22]. In the outbound logistics and supply chain management, the application of technology readiness index has been also discussed widely recently in term of the effect of TRI on the logistics and supply chain performance [28], [30], [32].

5. Conclusion

Technology Readiness Index (TRI) is a tool to measure consumer readiness in accepting new technology. Technology Readiness Index (TRI) can be used as a method for marketers to know consumer behavior toward new technology so that they could work effectively. The dimensions of staff or consumer readiness using new technology are segmented into four aspects, namely: (1) optimism (2) innovativeness (3) discomfort (4) insecurity.

The approaches and application of technology readiness in term of its integration with other

theories and its application on the sector of various industries have been discussed widely. A wide range theory such as marketing, TAM and TPB are integrated into TRI model. In term of TRI applications in retail industries, most studies discussed the readiness of customer or staff on technology adoption in some areas such as electronic banking and electronic money, while the application of TRI into logistics and supply chain managementt focused on the effect of TRI on the logistics and supply chain performance.

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